JUNE 1968
Valid from Serial no. 222.631

Parts-List

and

Trouble Shooting

Beat Frequency Oscillator

Type 1013

Brüel & Kjær

DENMARK

BH 1013

PARTS-LIST 1013

Component Type	Stock Reference		Circuit-diagram Reference
Carbon film ⅓ W	RK 1	kΩ	R 13-14
» »	RK 1.5	kΩ	R 15
» »	RK 2	kΩ	R 16, 18, 44
» »	RK 5	kΩ	R 17
» »	RK 10	kΩ	R 19-20
» »	RK 18	kΩ	R 71
» »	RK 19	kΩ	R 72
» »	RK 20	kΩ	R 21, 56
» »	RK 25	kΩ	R 22
» »	RK 27	kΩ	R 77
» »	RK 31.5	kΩ	R 24, 75, 86
» »	RK 50	kΩ	R 23, 80
» »	RK 54	kΩ	R 81
» »	RK 56	kΩ	R 85
» »	RK 76	kΩ	R 83
» »	RK 200	kΩ	R 28
» »	RK 1	MΩ	R 26
» ½ W	RK 10	Ω	R 10
» » ± 2 %	RK 125	Ω	R 37
» »	RK 160	Ω	R 38
» »	RK 200	Ω	R 39
» »	RK 500	Ω	R 40-42
» »	RK 2	kΩ	R 43, 45-47
» »	RK 6.3	kΩ	R 11
» »	RK 8	kΩ	R 48
» »	RK 10	kΩ	R 50
» »	RK 16	kΩ	R 49
» »	RK 18	kΩ	R 51
» »	RK 20	kΩ	R 52-55
» »	RK 28	kΩ	R 57
» »	RK 31.5	kΩ	R 58-61
» »	RK 50	kΩ	R 63
» »	RK 63	kΩ	R 64-65
» »	RK 80	kΩ	R 66
» »	RK 100	kΩ	R 67-69
» »	RK 160	kΩ	R 70
» »	RK 1	MΩ	R 74, 76
» »	RK 2	MΩ	R 73, 79
» »	RK 4	MΩ	R 82
» »	RK 25	MΩ	R 84
» »	RK 0.2	MΩ	R 78
Wire-wound 5 W 4 kΩ	RO 0307		R 95

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Component Type	Stock Reference	Circuit-diagram Reference
Miscellaneous:		
Bakelite knob, 30Ø	SN 3222 and DB 0674	
» » 30Ø, flat	SN 3202 » DB 0850	
» » 40Ø	SN 4021 » DB 0674	
» » 40Ø, twin marking	SN 4026 » DB 0674	
» » 53Ø	SN 6319 » DB 0675	
Frequency dial housing	SO 0188	
Frequency dial pointer	SV 0001	
Output transformer	TU 1013	T 2
Power transformer	TN 0008	T 1
Transformer	TN 5215	T 3
Magnetic clutch (Main unit)	UM 1011	
Oscillator coil assembly	ZS 0071	
Compressor coil assembly	ZS 0073	
H-F. filter	ZS 0077	
H-F. filter	ZS 0078	
Saw-tooth generator coil assembly	ZS 0054	
Tubes:		
Twin triode 12AT7 (ECC 81)	VA 0009	V 1-5
Amplifier pentode 6AU6 (EF 94)	VA 0021	V 6-8
Output pentode 6BQ5 (EL 84)	VA 0023	V 9
Twin diode 6AL5 (EAA 91)	VA 0005	V 10
Stabilizer OA2	VA 0037	V 12
Meter lamp (6.3/0.5)	VS 1271	V 13
Frequency dial lamp (6.3/0.3)	VS 8024	V 14
1 A Fuse	VF 0008	V 15

Please state type and serial number of apparatus, when spare-parts are ordered.

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TROUBLE SHOOTING 1013

Symptom and Condition	Defect	Cure
Apparatus does not work, no scale light.	Defective fuse V 15 switch N 4 transformer T 1.	Replace.
Apparatus does not work, scale light intact, stabilizer tube does not light.	Defective rectifier Q 5. condensers C 8-C 9, choke L 1.	Replace.
Voltmeter does not work, apparatus otherwise intact.	Defective V 4. P 21. C 16, C 34, R 48-R 49.	Replace. Clean, if necessary replace. Replace.
Voltmeter indicates incorrect in certain ranges (in all ranges).	R 105-R 108.	Replace or adjust (adjust P 21).
Power frequency beat does not work, apparatus intact.	Defective N 2, R 46, T 3, Q 4.	Replace.
Output power too low, distortion.	Defective V 8-V 9. Short-circuited C 2. Short-circuited turns in T 2.	Replace. Replace. Replace.
Attenuator O 4 shows incorrect damping.	R 118-135. Defective ground conn.	Replace or adjust. Re-soldering.
LF amplifier oscillates.	This is normal for capacitive loads above 0.002 μF.	Avoid these loads.
LF amplifier oscillates with capacitive load below 0.002 μF.	Defective V 9, T 2.	Replace.
Incorrect frequency characteristic, output voltage rather small and decreases rapidly when loaded.	Too little amplification in in V 8-V 9.	Replace V 8-V 9, check electrode voltages.
Incorrect frequency characteristic, output voltage very high when unloaded.	Negative feed-back open-circuit.	Replace R 21, R 38.
Incorrect frequency characteristic at low frequencies.	C 1, C 2, C 6, C 23, C 24, C 31 defective.	Replace.
AC-hum for small volume.	Defective V 8-V 9.	Replace.
Noisy volume control.	Contact path contaminated. Contact pressure too small.	Clean with benzine, if necessary with fine emery cloth. Grease with acid-free vaseline. Tighten spring.

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TROUBLE SHOOTING 1013

Symptom and Condition	Defect	Cure
Apparatus badly microphonic with volume control on maximum.	Mixer tube microphonic.	Replace V 3.
AC-hum in output voltage.	Defective mixer tube.	Replace V 3.
Noice and crackling.	Defective mixer tube.	Replace V 3.
Too little output voltage, but noise and AC hum normal.	Buffer V 7 worn out. Defect in tuning circuit ZS 0073. No anode or screen voltage on V 7.	Replace. Replace or adjust. Replace R 50, R 52, R 45.
No output voltage, but noise and AC hum normal.	No oscillator voltage on V 1: V 1 defective or lacks anode voltage.	Replace V 1. Clean N 1 if necessary tighten spring. Check 6-pin plug. Replace R 60, C 20.
Noiseless push-button switch makes noise, when oscillator stops.	Contaminated contacts.	Clean with benzine, if necessary polish with fine emery cloth.
Zero point is displaced more than 50 c/s when modulation switch is turned.	Ractance tube V 6 has changed.	Trimmer C 57 is adjusted with a screwdriver from the bottom. (Remove app. from cabinet).
Relaxation oscillator works only at the highest frequencies.	Defect in C 13 or V 1.	Replace.
Relaxation oscillator works only on the lower frequencies.	V 1 or ZS 0054 defective.	Replace.
All relaxation oscillator's frequencies are incorrect.	V 1 worn out. Voltage incorrect.	Replace V 1. Adjust R 95.
Modulation swing incorrect.	V 1-V 6 worn.	Adjust P 4.
Zero point cannot be set, even with C 52.	Apparatus moist. Condenser in oscillatory circuit has changed.	Dry. Adjust the trimmer on coil unit ZS 0071.
Oscillator frequency is far from the normal 1200 kc/s (frequency scale on 0).	Defective condenser or coil in the unit ZS 0071.	Replace defect or both units. When ordering give number on defect unit with regards to temp. coefficient.
Compressor regulation insufficient.	V 7's characteristic has not sufficiently sharp cut-off.	Replace V 7, if necessary increase R 79.

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